11-3
Geometric Sequences

-sequence in which each term after the first is found by multiplying the previous term by a constant (common ratio)

ex:
3, 12, 48, ...

r = 4

$r = \frac{12}{3} = 4$

ex:
100, 20, 4, ...

r = $\frac{1}{5}$

$r = \frac{20}{100} = \frac{1}{5}$

ex:
2, 6, 18, 54...

r = 3

Develop the formula.

$a_2 = 2\,3 = 6$

$a_3 = 2 \cdot 3^2 = 18$

$a_4 = 2 \cdot 3^3$

To find the nth term:

$a_n = a_1 \cdot r^{n-1}$

ex:
3, 9, 27, ...

Find a_7

$a_7 = 3 \cdot 3^4$
2,187

ex:
Write an equation for a_n

5, 10, 20, 40,...

$a_n = 5 \cdot 2^{n-1}$

ex:
$a_7 =$ 1536

$a_3 = 96$
$r = 2$

$a_7 = 96 \cdot (2)^4$ (7-3)

Geometric Means--terms between two given terms

ex:
Find three geometric means between 300 and $\frac{6075}{64}$

DO:
Find three geometric means between -3 and -12,288

$-3, \_, \_, \_, -12,288$

$-12,288 = -3(r)^4$

$(4,096)^{\frac{1}{4}} = (r^4)^{\frac{1}{4}}$

$\pm 8 = r$

HW

p591
15, 17, 21, 23, 31- 39odd, 38, 43, 45